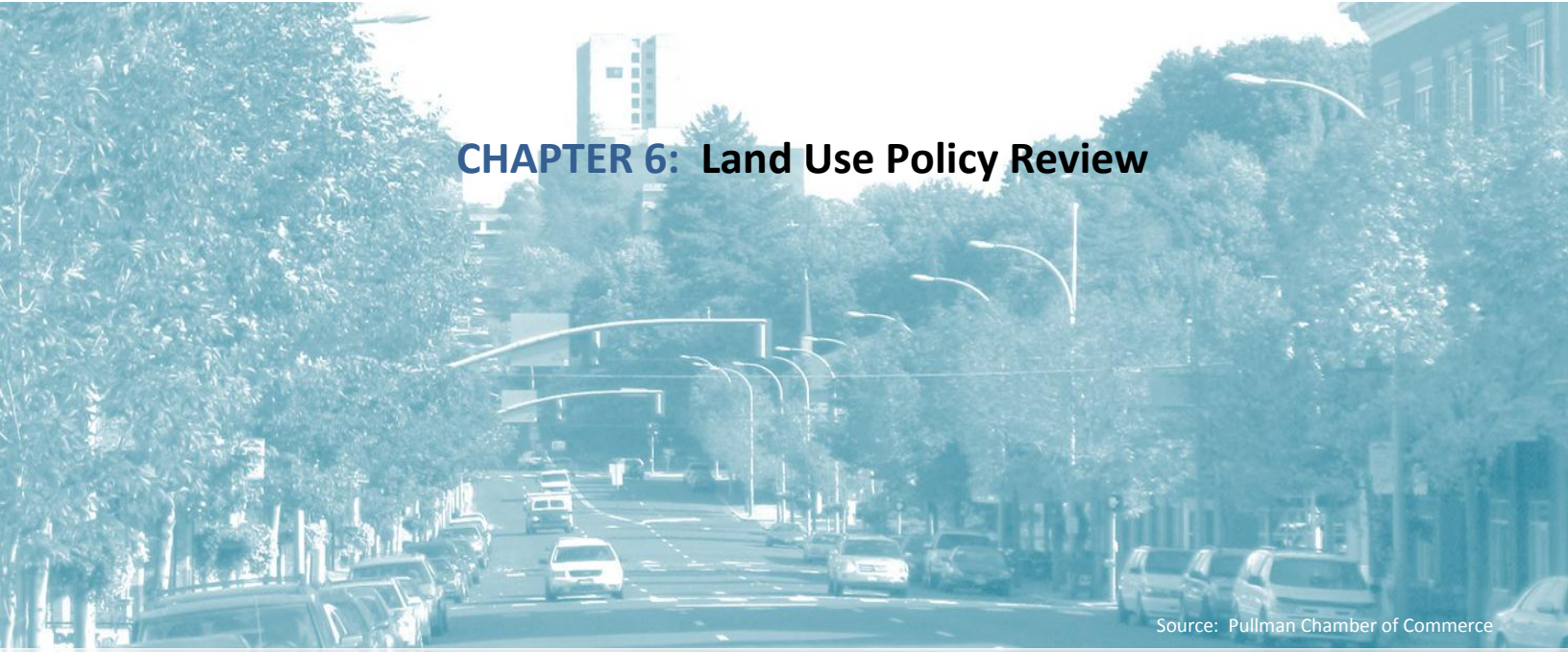
CHAPTER 6: Land Use Policy Review



Source: Pullman Chamber of Commerce

Overview

Airport land use compatibility is a planning activity that coordinates planning efforts between an airport, the host community, neighboring communities, transportation organizations and major institutions. The coordinated planning efforts are designed to bring about a collection of positive outcomes including safety, efficiency, comfort and economic prosperity. The goals of airport safety include protecting people and property on the ground, minimizing injury to aircraft occupants, and preventing the creation of flight hazards. Airport land use compatibility planning practices also protect the public's investment in the airport and in community infrastructure around the airport. In addition, airport land use compatibility practices strive to minimize the incompatibility between routine operations at an airport and adjacent land uses—especially those caused by noise and vibration. When airports and communities grow in a coordinated manner, the economic impacts of the airport may be maximized in the region.

This chapter explores the federal and state land use regulations and guidelines that are in place to support and direct airport land use compatibility efforts. Then a land use compatibility analysis is performed on both the existing and future conditions around the airport. Land uses and noise are both considered. Areas of existing or potential conflicts are identified and recommendations are made for corrective or preventative action. Finally, an instructional land use compatibility section is included for the region around PUW. This third section can be used in the community as a stand-alone resource for planning staff, commission members and others with land use authority.

6.1 Federal Land Use Regulations and Guidance

The Planning System

The *National Plan of Integrated Airport Systems* (NPIAS) provides the framework for national aviation planning activity for a 10-year planning horizon and is published every two years. The NPIAS identifies public-use airports across the country whose operations are important to the national interest. As a result, airports included in the NPIAS are eligible for federal funding for planning and improvement projects. This system was created under the Airport and Airway Improvement Act of 1982.

Planning for aviation may also be done at the state level. Here the state's transportation department documents the existing network of airports and plans for future needs of the system. This effort considers the creation of new airports and expansion at existing airports. Goal setting and public involvement are part of the planning process.

A master plan is also created for each individual airport. Master plans are developed according to the guidance provided by FAA Advisory Circular (AC) 150/5070-6, titled *Airport Master Plans* (June 1985). Master plans project future aviation activity over an extended planning horizon, identify improvements to meet future demand, and consider funding sources. Some elements of a master plan must be approved by the FAA.

Public Funding of Airports

The Federal Airport Act of 1946 created the Federal Aid to Airports Program (FAAP), a grants-in-aid program for public-use airports. The overall goal of the program was to support the development of a coordinated, national system of civil airports. The FAAP was replaced by the Airport and Airway Development Act in 1970. The Airport and Airway Development Act empowered the Secretary of Transportation to make grants for airport planning and improvement projects to maintain a safe and efficient nationwide system of public-use airports. To this end, airports that accept grant funding also accept several obligations or "grant assurances" designed to keep the airport functioning safely and efficiently. The assurances may become part of the final grant offer or may be recorded in restrictive covenants to property deeds.

The Airport and Airway Improvement Act of 1982 was adopted more recently. The provisions related to grant assurances remained intact through this legislative amendment and are expected to remain part of the funding program over the long term. The 1982 legislation also requires that airport

planning activities coordinate with other transportation planning activities, which is another tool for integrating land use compatibility into the aviation planning process.

Grant Assurances

Grant assurances are obligations of the airport that are put in place when grant funds are accepted. Their purpose is to assure that the airport continues to operate safely and efficiently over time. In total, there are 39 grant assurances. One example of a general obligation is Grant Assurance 1 that requires projects to comply with all other Federal laws. Some assurances address planning practices generally. Grant Assurance 6 requires that the project be reasonably consistent with the plans of public agencies in which the project is located, and Grant Assurance 7 requires that consideration be given to local interests. Grant Assurances 20 and 21 speak directly to airport land use compatibility and recognize compatibility as an important tool for maintaining both safety and operational efficiency. They read as follows:

Hazard Removal and Mitigation - It will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting, or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.

Compatible Land Use - It will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.

If an airport fails to comply with grant assurances, the FAA may place sanctions on the airport and may even require that the grant funds be repaid.

Safety and Efficiency Through Design

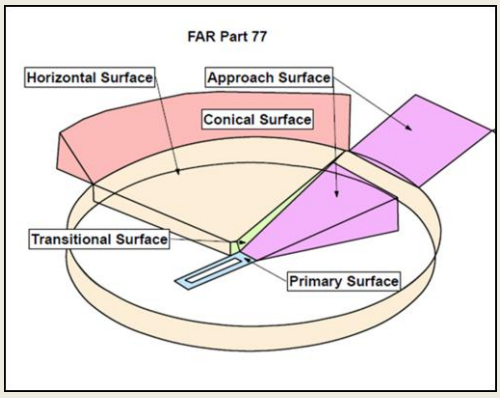
The FAA has established physical design standards for airports to support safety and efficiency. Most of those standards are contained in FAA's AC 150/5300-13, titled *Airport Design.* Its primary focus is on dimensional standards for airport runways, taxiways and other aircraft operating areas and safety areas. Safety areas are located beyond the runway ends. The property associated with these safety areas may or may not be owned by the airport. Airports are strongly encouraged to own the immediate safety areas beyond the runway and as a result, property acquisition is eligible for grant

funding. In lieu of ownership, use restrictions may be recorded for off-airport properties through an avigation easement. These constraints address height restrictions but may not include other elements of airport land use compatibility such as hazardous uses and wildlife hazards. Additional areas located beyond airport property may not be controlled by easement at all but may still pose land use compatibility challenges that result in operating restrictions for the airport. This symbiotic relationship between on- and off-airport land uses underscores the need for effective airport land use compatibility initiatives.

Another FAA Advisory Circular directly related to airport land use compatibility is AC 150/5200-33, titled *Hazardous Wildlife Attractants on or near Airports*. This guide addresses the unwanted interaction between aircraft and wildlife. Bird strikes during flight and the interaction of animals and bird species with aircraft on the ground is a safety hazard to aviation. This AC identifies land uses that have the potential to attract hazardous wildlife to or in the vicinity of public-use airports such as sanitary landfills and open water, including wetland mitigation areas, and recommends that these uses be located outside of safety areas.

Federal Aviation Regulations (FARs) are FAA policies that guide the development of implementation tools such as the AC resources noted previously. Several FARs address airport land use compatibility issues including navigable airspace and noise. FAR Part 77, *Objects Affecting Navigable Airspace*, is the guiding policy for airspace protection. It defines a set of imaginary surfaces that extend out from the runway in all directions. These surfaces are used to define the navigable airspace that should be protected through height limitations to promote safe and efficient airport operations. The protection area extends two to three miles around airport runways and approximately 9.5 miles from the ends of runways that have a precision instrument approach. FAR Part 77 also requires that the FAA be notified of proposed construction or alteration of objects that would be tall enough to break the plane of the imaginary surfaces.

FAR Part 77 Surfaces Part 77 surfaces are those areas established in relation to the airport and to each runway consistent with FAR Part 77 in which any object extending above these imaginary surfaces, by definition, is an obstruction.



Source: FAA

To support the policy requirement of FAR Part 77, a review process is in place to evaluate proposed development around an airport. The process is described in AC 70/7460-2J, *Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace*. The AC sets criteria for on- and off-airport construction requiring FAA notification. The title of the required notification form, *Form*

7460-1, has become synonymous with the process itself. When a request is submitted, the FAA renders a decision as to whether or not the proposed project is hazardous to the navigable airspace. However, the response has no regulatory authority. Land use authority to prevent obstructions rests solely with the local unit of government responsible for zoning. This divided process highlights the need for coordinated land use policies and cooperative decision-making to preserve the airport's operating efficiency.

There are other FARs that address airport land use compatibility through noise regulations. These regulations only apply to airports in the federal system of airports (NPIAS).

- **FAR Part 36**, *Noise Standards: Aircraft Type and Airworthiness Certification*, sets the noise limits that all newly produced aircraft must meet as part of their airworthiness certification.
- **FAR Part 91**, *General Operating and Flight Rules*, sets many of the rules by which aircraft flights within the United States are to be conducted, including rules governing noise limits.
- **FAR Part 150**, *Airport Noise Compatibility Planning*, implements the *Safety and Noise Abatement Act of 1979*. These regulations establish a voluntary program that airports can use to conduct airport noise compatibility planning. Part 150 prescribes a system for measuring airport noise impacts and presents guidelines for identifying incompatible land uses. Part 150 studies are eligible for federal funding both for the study itself and for implementation.
- **FAR Part 161**, *Notice and Approval of Airport Noise and Access Restrictions,* implements the *Airport Noise and Capacity Act of 1990* that was designed to balance local needs for airport noise abatement with national needs for an effective air transportation system. An extensive cost-benefit analysis of proposed restrictions is required and the analysis requirements are closely tied to the process set forth in FAR Part 150.

Environmental Regulation

Another federal regulation that impacts planning and design at airports is the National Environmental Policy Act (NEPA) of 1969. The Act established a commitment on behalf of the federal government to consider the impacts of a proposed project on the environment and community around it. For federally funded projects and most state funded projects, the Act establishes a framework for the environmental review process. This is another example of an overlap between airport and community planning activities. Airport master plans should lay a foundation for the NEPA review process.

6.2 State Land Use Regulations and Guidance

The State of Washington provides guidance and regulation to encourage best practices in community land use planning and airport land use compatibility. The Revised Code of Washington (RCW) is a compilation of all permanent state laws including aeronautic laws, the Planning Enabling Act and the Growth Management Act. The Washington Administrative Code (WAC) is a compilation of regulations from executive branch agencies issued by authority of statutes. Like legislation, regulations are a source of primary law in Washington State. Both resources contain regulations related to airport land use compatibility.

Aeronautic Laws

Most aeronautics laws are found under RCW Title 14. The *Municipal Airports Act* is RCW 14.07 and 14.08; adopted in 1941 and most recently modified in April 2009. It provides for the acquisition and sponsorship of airports by Washington cities, towns, counties, port districts and airport districts. The *Airport Zoning Act* is RCW 14.12; adopted in 1945 and most recently modified in April 2009. This Act defines an airport hazard as "any structure or tree or use of land which obstructs the airspace required for the flight of aircraft in landing or taking-off at an airport or is otherwise hazardous to such landing or taking-off of aircraft." It allows local jurisdictions to adopt zoning controls to protect critical airspace from obstructions.

The Planning Enabling Act

Washington's *Planning Enabling Act* is Chapter 36.70 of the RCW. The Act is a set of state laws that describe planning authorities and responsibilities for towns, cities and counties. The Act defines airports as essential public services (RCW 36.70A.200) and recognizes them as part of the multi-modal transportation system (RCW 36.70A.070). The following sections are especially applicable to airport land use compatibility planning:

RCW 36.70.320 Comprehensive plan requires that counties prepare a comprehensive plan. Other provisions establish similar requirements for cities and towns. Comprehensive plans are required to include both a land use and a circulation element and the community must consult with aviation interests prior to plan adoption.

RCW 36.70.547 General aviation airports mandates that every local unit of government discourage the siting of incompatible land uses adjacent to a general aviation airport if the airport is operated for the benefit of the public. It is to be done both through the comprehensive plan and development

regulations. In addition, there must be formal consultation by the local unit of government with aviation stakeholders before a comprehensive plan is adopted.

The Act also includes a mandate that the Washington State Department of Transportation's Aviation Division (WSDOT Aviation) provide technical assistance to communities during their planning process.

Growth Management Act (GMA)

The *Growth Management Act* (GMA) was adopted in 1990. It expands on the Planning Enabling Act's requirements for comprehensive planning in the most densely populated and fastest growing counties in Washington State. Whitman County is classified as "partially planning" under GMA and as such is required to create critical area ordinances and a shoreline ordinance. There are other provisions of the GMA that do not apply to Whitman County.

Washington Administrative Code (WAC)

Airport land use compatibility is also present in the Washington Administrative Code (WAC). WAC 365-196-455 is titled *Land use compatibility adjacent to general aviation airports*. Its language mirrors that of the Planning Enabling Act with respect to comprehensive plans and development regulations. Local units of government must discourage the siting of incompatible land uses adjacent to any public-use general aviation airport in the community. Before a comprehensive plan is adopted, consultation with airport owners and managers, private operators, general aviation pilots, ports and the aviation division of WSDOT is required. WAC 365-196-455 also references the state law related to the siting of essential public services.

The WAC also includes recommendations for formal consultation when a change is proposed to the comprehensive plan or zoning regulations that would affect airport operations. The WAC notes that the following are considered incompatible land uses:

- Residential encroachment
- High intensity uses such as K-12 schools, hospitals and major sporting events
- Airspace and height hazard obstructions
- Noise and safety issues

Washington State Airport Land Use Compatibility Regulations and Guidelines

Washington State regards land use compatibility between airports and surrounding land uses as a topic of statewide importance. In the statewide Growth Management Act (GMA), airports are defined as "essential public facilities" and counties and cities planning under the act must address the siting of these facilities in their comprehensive plans (RCW 36.70A.200). In addition, the GMA requires towns, cities and counties to discourage development of incompatible land uses adjacent to public-use airports through adoption of comprehensive plan policies and development regulations (RCW 37.70.547).

WSDOT Aviation's responsibility under the GMA is to advocate for the preservation and protection of public-use airports. WSDOT, though, does not have regulatory authority over local land use decisions. Rather, its role is to offer technical assistance to local entities by providing local decision makers with the best available information about airport land use compatibility.

Toward this end, WSDOT Aviation has published the *Airports and Compatible Land Use Guidebook,* January 2011. The Guidebook is designed to help airports, communities and jurisdictions work cooperatively and proactively towards preventing incompatible development around airports in the state. Jurisdictions can use the tools and resources found in the guidelines to develop policies and development regulations that discourage the encroachment of incompatible land use adjacent to public-use general aviation facilities. The Guidebook emphasizes airspace protection and discourages development of residential buildings, schools, hospitals and other medical facilities adjacent to airports, especially in the extended centerline of the airport runway. Most industrial and commercial land uses are identified as airport-compatible. The Guidebook will be explored in more detail as an implementation tool later in this chapter.

6.3 Local Land Use Controls and Impacts

The role of local land use agencies is critical to the effective execution of airport land use compatibility initiatives. As noted previously, the federal government provides regulations and funding for airport facilities but has no land use authority. The FAA reviews and makes recommendations on land use issues and looks to airports to actively discourage incompatible land uses around the airport. However, neither the FAA nor the airport can regulate or permit activities located off of the airport. That role is reserved exclusively for local units of government with planning and zoning authority. Regional entities with established communication networks and common goals may offer additional support. This section explores the regional organizations and local land use authorities around PUW.

Region

The Palouse Regional Transportation Planning Organization (PRTPO) is part of the Southeast Washington Economic Development Association (SEWEDA). The organization serves Asotin, Columbia, Garfield and Whitman Counties. Founded in 1985, SEWEDA was created to promote economic vitality in the region. In 1992, SEWEDA added the role of the PRTPO to its list of services. As the regional transportation planning organization, the PRTPO plans for distribution of federal transportation dollars in the region. The group operates with a Policy Board of Directors and Technical Advisory Committee—each committee includes representatives from each of the four counties. The PRTPO already plays an important role in the region; however, there are numerous opportunities to expand the role of this organization as a leader in regional transportation planning initiatives.

County

PUW is located in the southwest section of Whitman County; a largely rural and agricultural area in the southwest part of Washington State called the Palouse region. The Whitman county seat is located in Colfax. The City of Moscow, Idaho, is located in Latah County, and is the county seat. PUW is located between Pullman and Moscow and serves the populations of both counties. Whitman County has land use authority over some of the area included in the current and future airport safety zones. These areas are largely agricultural, which is generally compatible to airport operations. However, planning and development review processes should evaluate airport land use compatibility on a case by case basis. Even in an agricultural zone, site features like open water or unique uses like wind turbines can be incompatible with airport operations. Latah County's land use authority does not extend into either the Airport's current or future safety areas and, as a result, will have minimal impacts on the Airport's operation.

The Port of Whitman County is an economic development organization that is also dedicated to the preservation of multi-modal transportation. This organization does not have land use authority. However, it is uniquely situated to support the development of new commercial and industrial development sites on the airport and the continued growth of air travel for business travelers and future cargo opportunities.

Local Land Use Regulation

City of Pullman

The City of Pullman is the largest urban area in Whitman County, is home to Washington State University and has an estimated 2009 population of 27,600. The City of Pullman offers a full range of urban utilities and services to the community. A full-time planning staff performs planning functions

and administers the zoning ordinance for areas within the city limits. Most areas within the city have been developed and are currently being used; there are very few vacant parcels. In the city's comprehensive plan, the future land use map also assigns future land use classifications to areas outside the city limits that will be annexed in the future. The City of Pullman is responsible for land use decisions within several of the Airport's safety compatibility zones. The size of the area is expected to increase over time and the urban development patterns need to be carefully coordinated to support airport land use compatibility.

City of Moscow

The City of Moscow is the county seat for Latah County and home to the University of Idaho. Moscow is located on the westernmost border of the county and the state's north central region. It is the county's largest city with a 2005 population of 21,700. The City of Moscow offers a full complement of urban services and has a community development department that carries out planning and zoning functions for the city. The airport safety areas do not include land in the City of Moscow so land use decisions are not expected to impact airport land use compatibility directly. However, the city has the opportunity to support the goals of the airport in a variety of ways. The City's Transportation Committee, for example, will guide the development of a multi-modal transportation plan in the near future, which can coordinate with the regional transportation goals of the Airport.

Washington State University

Washington State University (WSU) is located on the west end of the current and future runway and has land use control of critical areas of the Airport's safety compatibility zones. Although WSU is located in the City of Pullman, it is autonomous with respect to planning and land use regulation. The City has designated the WSU campus as a single zoning district where zoning review and permitting requirements are waived. The Capital Planning and Development (CPD) Department at WSU is responsible for sustaining, planning and improving the university's built environment and carries out the planning and development review functions of the university. Land use coordination with the CPD Department is essential to promoting airport land use compatibility and protecting the airport's critical airspace.

Issue Identification / Gap Analysis

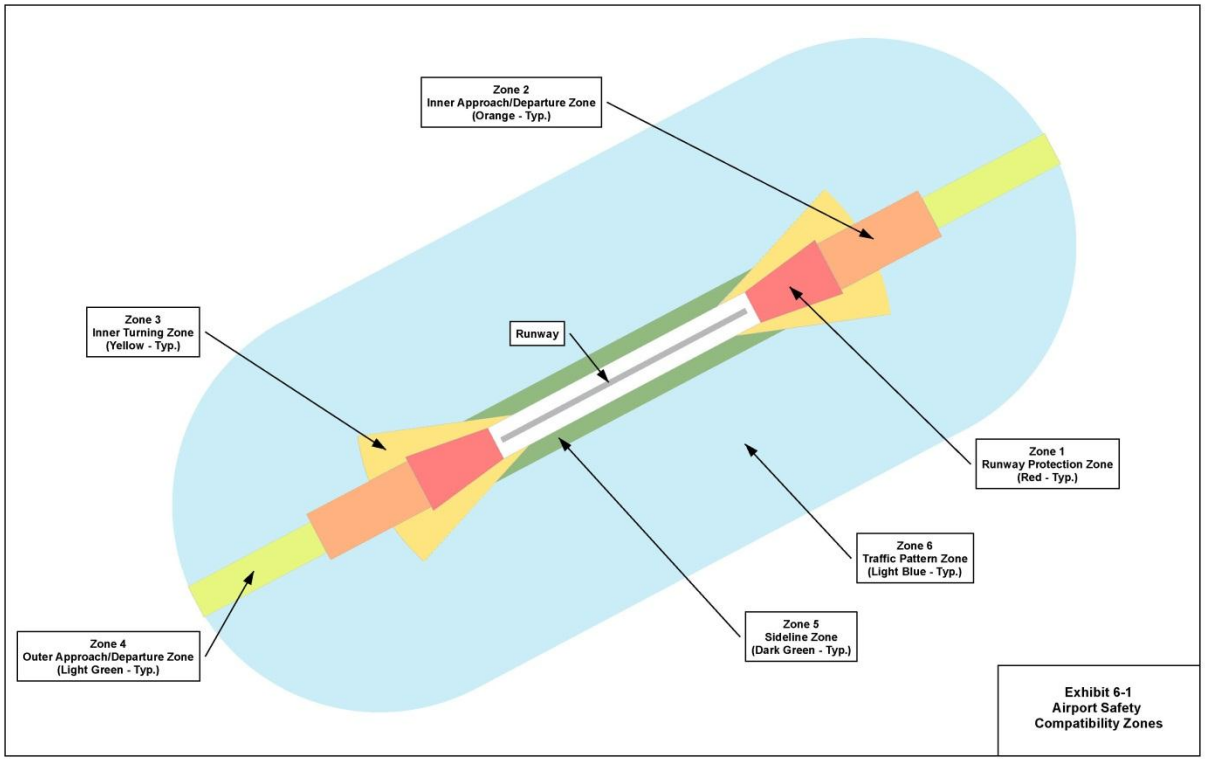
Methodology

The WSDOT *Airport and Compatible Land-Use Program Guidebook* (January 2011) includes a reference to the 2002 *California Airport Land Use Planning Handbook* and its comprehensive examination of accident locations. As a result of the original analysis, a hierarchy of six distinct safety

zones called Airport Safety Compatibility Zones (ASCZ) was developed based on different risk factors. Each zone also has a distinct set of compatible land uses. The zones are included in Appendix F of the WSDOT Airport and Compatible Land-Use Program Guidebook and were used in this land use compatibility analysis. The resulting zones are shown in **Exhibit 6-1**. The zones are:

- Zone 1: Runway protection zone
- Zone 2: Inner approach and departure zone
- Zone 3: Inner turning zone
- Zone 4: Outer approach and departure zone
- Zone 5: Sideline zone
- Zone 6: Traffic pattern zone

Exhibit 6-1: Airport Safety Compatibility Zones



Source: Mead & Hunt

The area covered by the ASCZ for each runway configuration in the planning study impacts property in the City of Pullman, Whitman County and the WSU campus. Land use data for the City of Pullman and Whitman County was available geographically and was used to compare recommended land uses for the ASCZ with existing and future land uses in both municipalities. Areas of conflict are identified and corrective action is explored in the analysis section. Before analysis, the ASCZs are

explored in general as an educational tool for land use planners in the region. Then, the six zones are applied to the current runway, the proposed runway at 7,100 feet and the proposed runway at 8,000 feet. Because the results are identical for each scenario, they are shown on a single exhibit. Results for the City of Pullman are shown on **Exhibit 6-2** and for results for Whitman County are shown on **Exhibit 6-3**.

Airport Safety Compatibility Zones (ASCZ)

Zone 1 is the Runway Protection Zone (RPZ), as defined by FAA criteria, located directly off each runway end. As a result, the most restrictive set of recommendations apply to this area:

- Airport ownership of property encouraged
- Prohibit all new structures
- Prohibit residential land uses
- Avoid nonresidential uses except if very low intensity in character and confined to the sides and outer end of the area

Zone 2 is the Inner Approach and Departure Zone, extending beyond the RPZ. Zone 2 also extends along the sides of the RPZ if the RPZ is narrow. Zone 2 encompasses areas overflown at low altitudes – typically only 200 to 400 feet above runway elevation. This is a substantial risk area. Out of all near-airport aircraft accidents in the US, 30 to 50 percent of these occur in Zones 1 and 2. As a result, the following basic compatibility qualities apply to this area:

- Prohibit residential uses except on large, agricultural parcels
- Limit nonresidential uses to activities that attract few people (unacceptable use examples: shopping centers, restaurants, theaters, multi-story office buildings and labor intensive manufacturing centers)
- Prohibit schools, day care centers, hospitals, nursing homes
- Prohibit hazardous uses (e.g. above ground fuel storage)

Zone 3 is the Inner Turning Zone that extends out at a wider angle from Zone 1. It encompasses locations where aircraft are typically turning from the base to final approach legs of the final traffic patterns and are descending from traffic pattern altitude. This zone also includes the area where departing aircraft transition from takeoff power to a climb mode and begin to turn to their en route heading. As a result, the following basic compatibility qualities apply to this area:

- Limit residential uses to very low densities (if not deemed unacceptable due to noise)

- Avoid nonresidential uses having moderate or higher usage intensities (e.g., major shopping centers, fast food restaurants, theaters)
- Prohibit schools, large day care centers, hospitals, nursing homes
- Avoid hazardous uses (e.g., aboveground fuel storage)

Zone 4 is the Outer Approach /Departure Zone, extending out from the runway centerline beyond Zone 2. Risk in this area is the result of approaching aircraft flying at less than traffic pattern altitude. As a result, these basic compatibility qualities apply to this area:

- In undeveloped areas, limit residential uses to very low densities (if not deemed unacceptable due to noise); if alternative uses are impractical, allow higher densities as infill in urban areas
- Limit nonresidential uses as in Zone 3
- Prohibit schools, large day care centers, hospitals, nursing homes

Zone 5 is the Sideline Zone, encompassing close-in area that is adjacent and lateral to the runway. These areas are not normally overflown. The primary risk in this area is with aircraft losing directional control on takeoff. On most airports, these areas are usually on airport property. The following basic compatibility qualities apply to this area:

- Avoid residential uses unless airport related (noise usually a factor)
- Allow all common aviation-related activities provided that height-limit criteria are met
- Limit other nonresidential uses similarly to Zone 3, but with slightly higher usage intensities
- Prohibit schools, large day care centers, hospitals, nursing homes

Zone 6 is the Traffic Pattern Zone, encompassing all areas used as part of regular traffic patterns. The risk in this zone is relatively low but there is a concern over uses for which the potential consequences of an accident are severe. As a result, these basic compatibility qualities apply to this area:

- Allow residential uses
- Allow most nonresidential uses; prohibit outdoor stadiums and similar uses with very high intensities
- Avoid schools, large day care centers, hospitals, nursing homes

Local Land Use Classification Categories

Land use within the ASCZ is directed by three different local land use authorities: the City of Pullman; Whitman County and Washington State University. Each entity is essentially autonomous in its ability to assign land use classifications or approve development proposals. Coordination and cooperation is encouraged but is not legally required. A brief summary of the current and future zoning classifications for the City and County are provided here.

Current Zoning Regulations

The City of Pullman administers a Zoning Ordinance based on a Comprehensive Land Use Plan. Land use categories for planning purposes in the Comprehensive Plan include Low Density Residential, High Density Residential, and Commercial, Industrial, Public and WSU categories. At the implementation level, the Zoning Ordinance includes five separate residential categories, two commercial categories and three industrial classifications.

Currently, the airport property itself is part of the city but the land around the airport is surrounded by WSU and Whitman County property. The City of Pullman shows plans for future commercial zoning around the airport as part of future plans for a boundary expansion through annexation. In addition, the City also makes use of several floating zones for Planned Residential Development, Manufactured Housing Development, Recreational Vehicle Parks and the "Limited" zone that functions like a special use permit. The location of a floating zone is established as part of the planning review process. When a floating zone is proposed, the Airport Safety Zones should be part of the zoning review process since each of the floating zones has the potential to be a high intensity use.

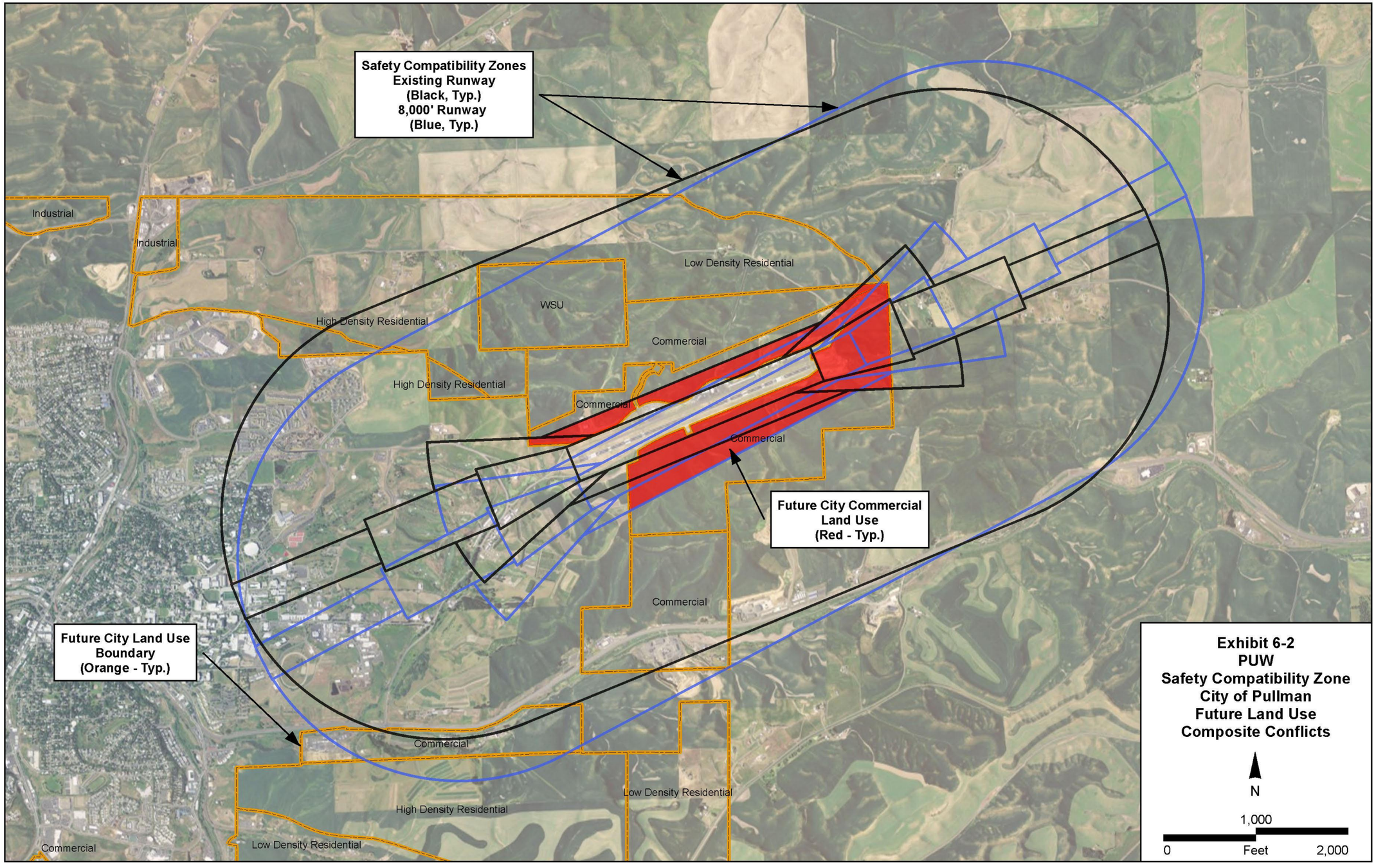
The City's Zoning Ordinance includes an Airport Overlay zone to provide special consideration for areas around the airport. As currently written, the Airport Use Restriction Overlay district in the City's Zoning Ordinance is defined as "all areas where the existing or potential airport-related noise levels exceed 65 Ldn (day-night average)" [17.95.020.11]. By that definition, according to the noise analysis in **Section 4.0** of this chapter, the overlay zone is applicable only on airport property. There is also a Height Restriction Overlay district based on the Part 77 surface language, which is an effective reference for height. The combined district restricts any use that in any way endangers aircraft operations and restricts some uses that may be impacted by airport noise, including residential and educational uses.

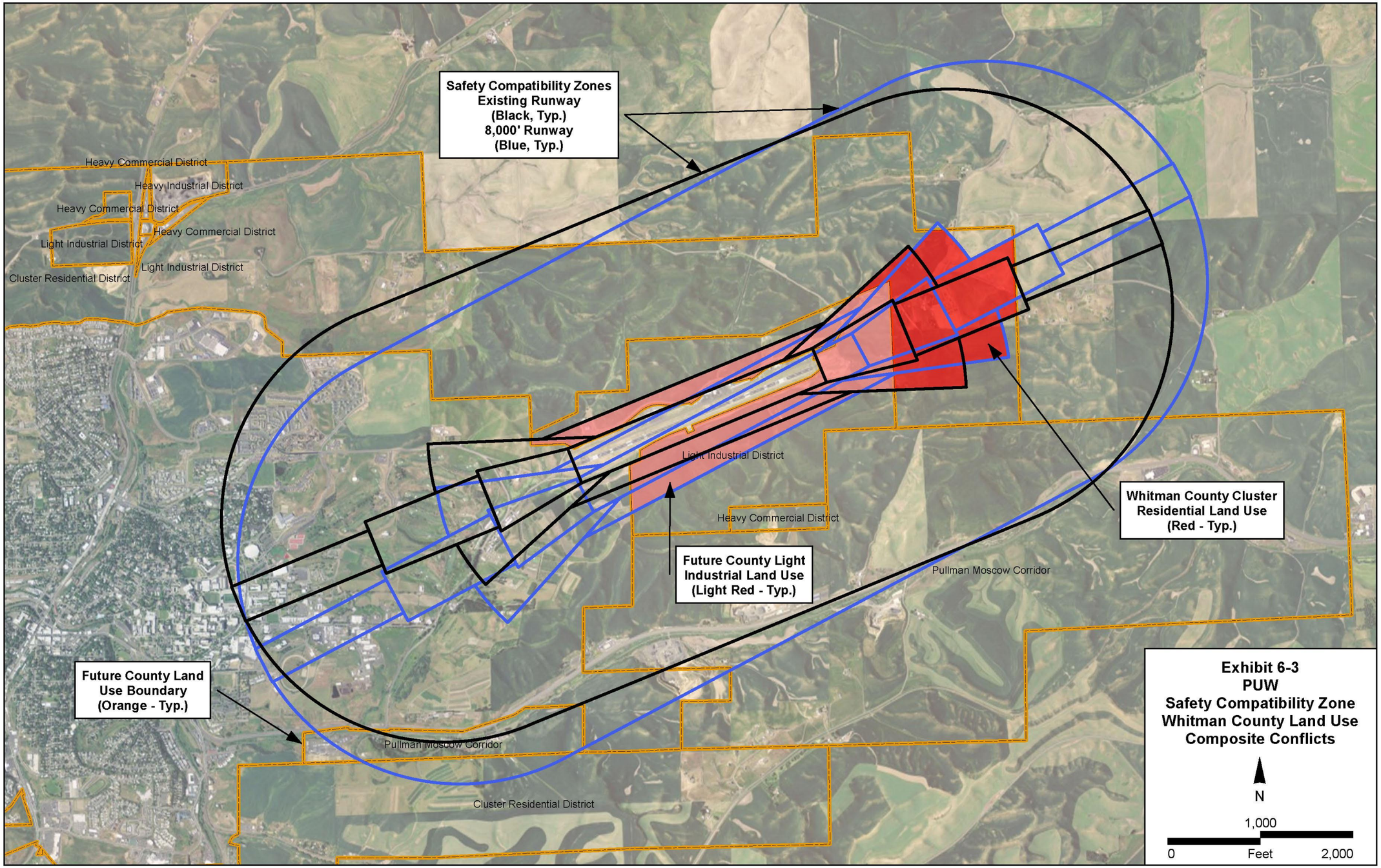
Although most of Whitman County is sparsely populated agricultural and open land, zoning districts around the Airport include the Cluster Residential District, Light Industrial District, Heavy Commercial District and the Pullman Moscow Corridor district. Whitman County's Zoning Ordinance includes an

Airport Landing Zone Overlay District, which is defined by the Part 77 Surfaces. It contains height limitations, restricts public assembly uses and glare producing materials, and addresses development in noise sensitive areas.

While both the city and county ordinances have many positive attributes and take a step in the right direction, a more comprehensive approach to airport land use compatibility is presented later in this chapter and is recommended as a replacement to the current zoning ordinance language in both communities. Recommendations include defining the Airport Overlay zone by the limits of the ACSZ, restricting land uses based on safety zone recommendations, and providing for conditional use restrictions to address glare, smoke and wildlife hazards more specifically.

An analysis of the surrounding land uses concluded that there were no current conflicts with the City of Pullman's current zoning land use designations. The "City Future" map (**Exhibit 6-2**) shows parcels that are outside of the city limits but included within the City's urban growth area. These parcels will likely be annexed into the City at some point in the future. The County map (**Exhibit 6-3**) shows parcels that are in Whitman County. A table showing current land uses within each ACSZ is included in **Appendix H**. No analysis was performed on WSU property because the university zone doesn't clearly translate to traditional land use types. However, the information in this section can be used by campus planning staff for independent evaluation. Alternatively, the City may choose to exercise its land use authority over the university property with regard to an airport overlay zone.


Safety Compatibility Zones
Existing Runway
(Black, Typ.)
8,000' Runway
(Blue, Typ.)
Industrial
Industrial
Low Density Residential
WSU
High Density Residential
Commercial
High Density Residential
Commercial
Commercial
Future City Commercial
Land Use
(Red - Typ.)
Commercial
Future City Land Use
Boundary
(Orange - Typ.)
Commercial
Low Density Residential
High Density Residential
Commercial
Low Density Residential
Exhibit 6-2
PUW
Safety Compatibility Zone
City of Pullman
Future Land Use
Composite Conflicts
N
1,000
0
Feet
2,000


Safety Compatibility Zones
Existing Runway
(Black, Typ.)
8,000' Runway
(Blue, Typ.)
Heavy Commercial District
Heavy Industrial District
Heavy Commercial District
Heavy Commercial District
Light Industrial District
Light Industrial District
Cluster Residential District
Light Industrial District
Heavy Commercial District
Pullman Moscow Corridor
Whitman County Cluster
Residential Land Use
(Red - Typ.)
Future County Light
Industrial Land Use
(Light Red - Typ.)
Future County Land
Use Boundary
(Orange - Typ.)
Pullman Moscow Corridor
Cluster Residential District
Exhibit 6-3
PUW
Safety Compatibility Zone
Whitman County Land Use
Composite Conflicts
N
1,000
0
Feet
2,000

Issue Identification / Gap Analysis

The Future Land Use Composite Conflicts for the City of Pullman identifies conflicts with commercial land use at the east end of the runway in Safety Zone 1 and directly adjacent to both sides of the runway in Safety Zone 5. The County Composite Conflicts map shows a conflict with Cluster Residential in Safety Zones 1, 2 and 3 and with the Light Industrial district in Safety Zones 1, 3 and 5. In each case, the parcel in question is larger than the safety zone and only the safety zone conflict is shaded on the map.

Safety Zone 1, the RPZ, is a very high risk area and has the most restrictive recommendations including airport ownership of the property where possible, prohibition of all new structures and avoidance of all residential and most nonresidential uses.

Safety Zone 2, the Inner Approach and Departure Zone, is a substantial risk area as well. Land use compatibility guidelines in Zone 2 prohibit residential uses except on large, agricultural parcels and restrict most commercial and institutional uses.

Safety Zone 3 is the Inner Turning Zone and is a transition zone for smaller aircraft on takeoff and approach. Land use compatibility guidelines in Zone 3 limit residential uses to very low densities, which may be compatible with the cluster development zone depending on design.

Safety Zone 5 prohibits residential uses altogether. Some commercial uses may be appropriate but special limitations should be placed on the type of permitted commercial use as well as the site design in this area.

In each of these Safety Zones, commercial uses that serve large groups of people including restaurants, shopping centers and theaters should not be permitted. Also, uses with hazardous materials such as gas stations should be prohibited. Site design criteria should carefully regulate off-site impacts including lighting, glare, smoke and open water.

Action steps to address these land use compatibility issues are presented in **Section 5.0** of this chapter. Regulatory action is implemented through zoning regulations, which may be in the form of an overlay zone in the existing zoning ordinance or developed as a separate regulatory ordinance. Zoning ordinance amendments may be developed independently or cooperatively through a joint planning effort between the city and the county. Implementation can also be done independently or through a joint planning initiative. The WSU land is an anomaly in the current airport land use compatibility equation in its current semi-autonomous position. A comprehensive land use compatibility effort for PUW must include WSU as a cooperative partner or as part of the City's regulatory actions.

6.4 Noise

Since the introduction of the turbo jet aircraft in the late 1950s, aircraft noise has been the primary driver of airport land use compatibility conflicts. Noise related issues are challenging in part because the perception of an acceptable level of noise varies from person to person, varies depending on location and activity and varies depending on time of day.

As part of this planning process, federal noise standards for airports were used to perform a noise analysis for the current and proposed runway alignment at PUW. Areas of existing and potential conflicts were identified and are noted in this section.

FAA Guidance

The primary federal regulation guiding and controlling planning for aviation noise compatibility on and around airports is Federal Aviation Regulation (FAR) Part 150, *Airport Noise Compatibility Planning*. The goal of the Part 150 process is to mitigate the noise impacts that airports have on the surrounding area while maintaining the efficiency of the national aviation system. Part 150 establishes voluntary standards for measuring, mapping and analyzing noise compatibility. Grant funding is available to implement noise mitigation measures identified thought the Part 150 process.

Part 150 was created by the authority of the Aviation Safety and Noise Abatement Act of 1979. Prior to that, the FAA published the 1976 Aviation Noise Abatement Policy. In earlier legislation, the Noise Control Act of 1972 was enacted to protect Americans from noise levels high enough to jeopardize health and welfare and the Aircraft Noise Abatement Act of 1968 required the FAA to develop and enforce safe standards for noise generated by aircraft.

Advisory Circular (AC) 36-1, *Noise Levels for U.S. Certificated and Foreign Aircraft* and 14 CFR Part 36, *Noise Standards: Aircraft Type and Airworthiness Certification,* defines standard aircraft noise levels used for the Part 150 process and other aviation noise analysis.

Aircraft Noise Analysis

This section compares noise exposure levels for 2010 with projected noise exposure levels for 2015 and 2020 based on the new runway alignment. The following analysis identifies the location of noise contours in relation to adjacent land uses. Noise contours are incorporated into land use analysis for the City of Pullman, Whitman County and Washington State University. Runway improvements identified in **Chapter 3** are included in the 2015 and 2020 noise analysis.

Methodology

To prepare a noise exposure map, the FAA Integrated Noise Model 7.0 (INM) requires information concerning the number of aircraft operations, the types of aircraft (fleet mix), the time of day (day or night) that activity occurs, runway utilization patterns and the typical flight tracks of aircraft. Coordination with airport staff and the FAA and evaluation of the aviation demand forecasts presented in **Chapter 2** provided the necessary information to model existing and future noise exposure levels at PUW. Data input into INM are included in **Appendix I.**

Aircraft Fleet Mix

PUW has a diverse fleet mix. In 2010, scheduled commercial service was provided by the Horizon Air's Bombardier Q400 aircraft. Charter service is provided by Bombardier Q400, Airbus 319 and Boeing 737. General aviation aircraft types include single-engine piston, multi-engine piston, medium and large turbo jets and turbo props. Helicopters and military transport aircraft are also part of the fleet mix. PUW's fleet mix was developed based on information from FAA databases, Flight Aware and airport management.

Airport Operations

The frequency of aircraft operations are based on the FAA-approved aviation activity forecasts. Existing and forecasted itinerant operations are divided evenly into approach and departure operations. Local operations are classified as touch-and-go operations.

Daytime-Nighttime Operations

Nighttime operations occur between 10:00 pm and 7:00 am. INM assigns "penalties" to nighttime operations because aircraft noise is perceived to be louder at night when ambient sound levels are lower. The proportions of daytime and nighttime activity for commercial operations are based on published flight schedules, which indicate 33 percent of flights are nighttime operations. Airport management estimates that 95 percent of GA and military aircraft operations occur during the daytime, and five percent occur during the nighttime.

Runway Utilization

Runway utilization includes the number, location and orientation of the active runways, as well as the directions and types of operations that occur on each runway. Runway utilization depends primarily on wind direction and speed, but is also a function of aircraft operator procedures. Runway utilization percentages are presented in **Table 6-1**.

Table 6-1: Runway Utilization	
Runway End	**Percent of Annual Operations**
05	60%
23	40%

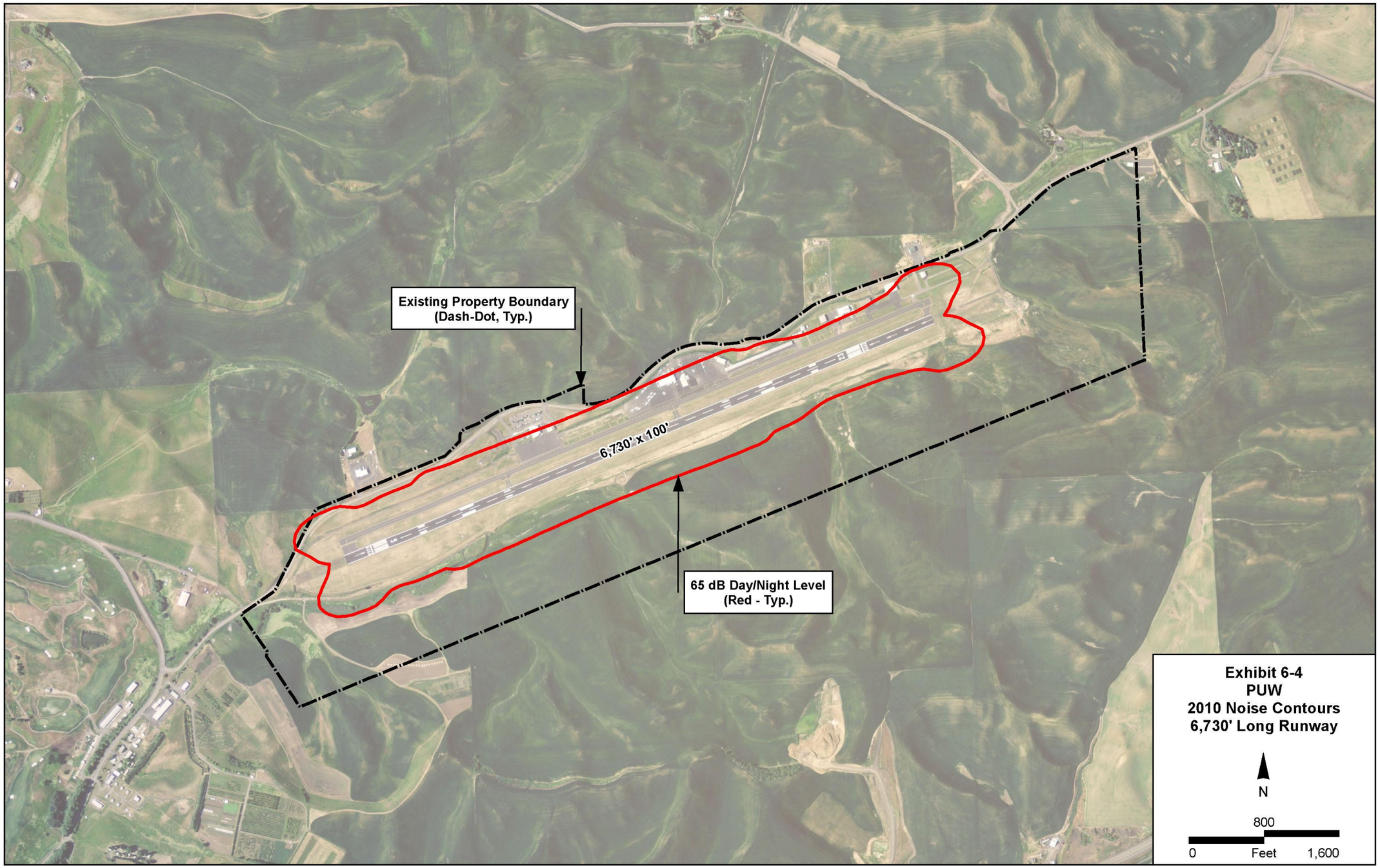
Source: Airport Management Estimate

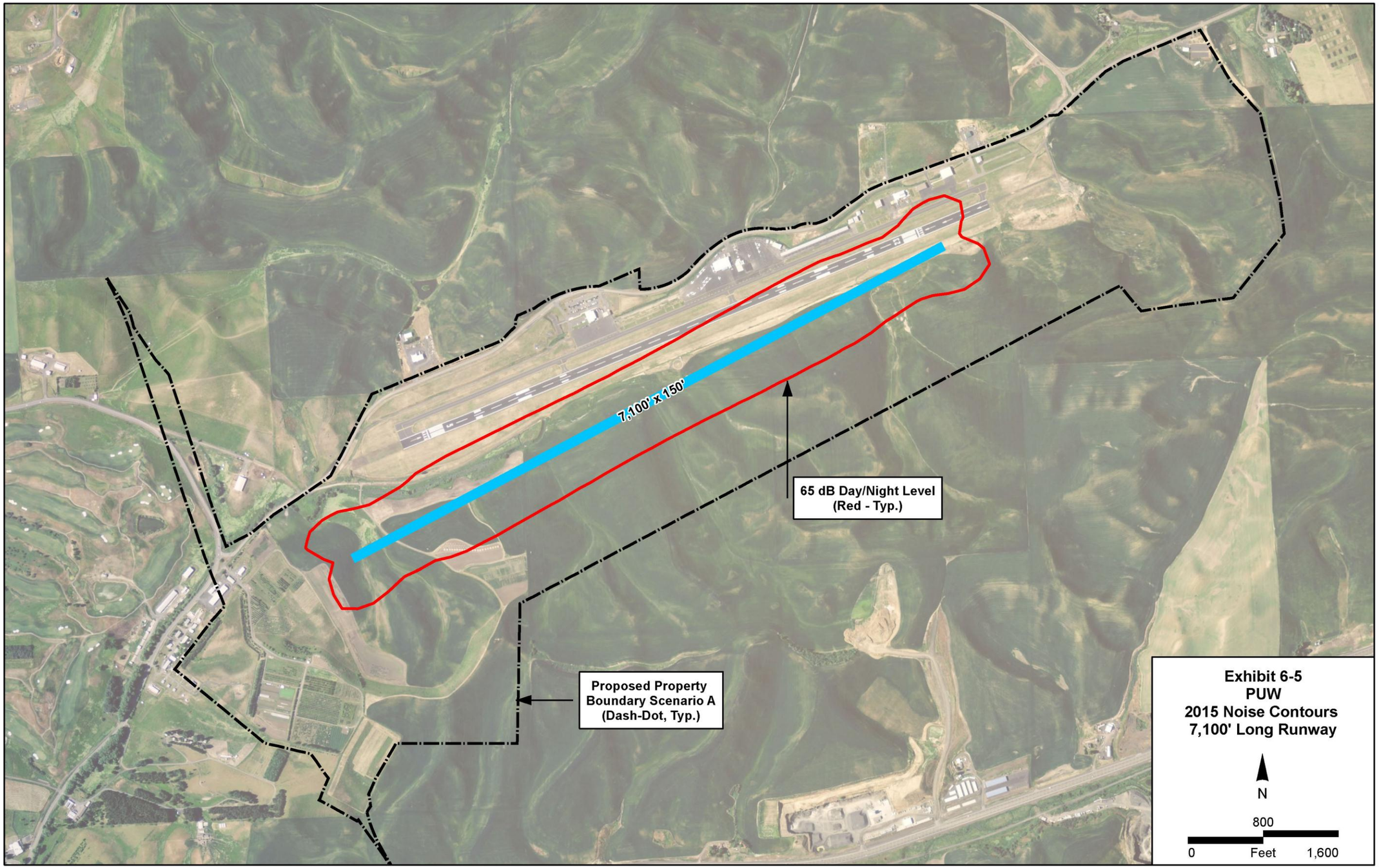
Flight Tracks

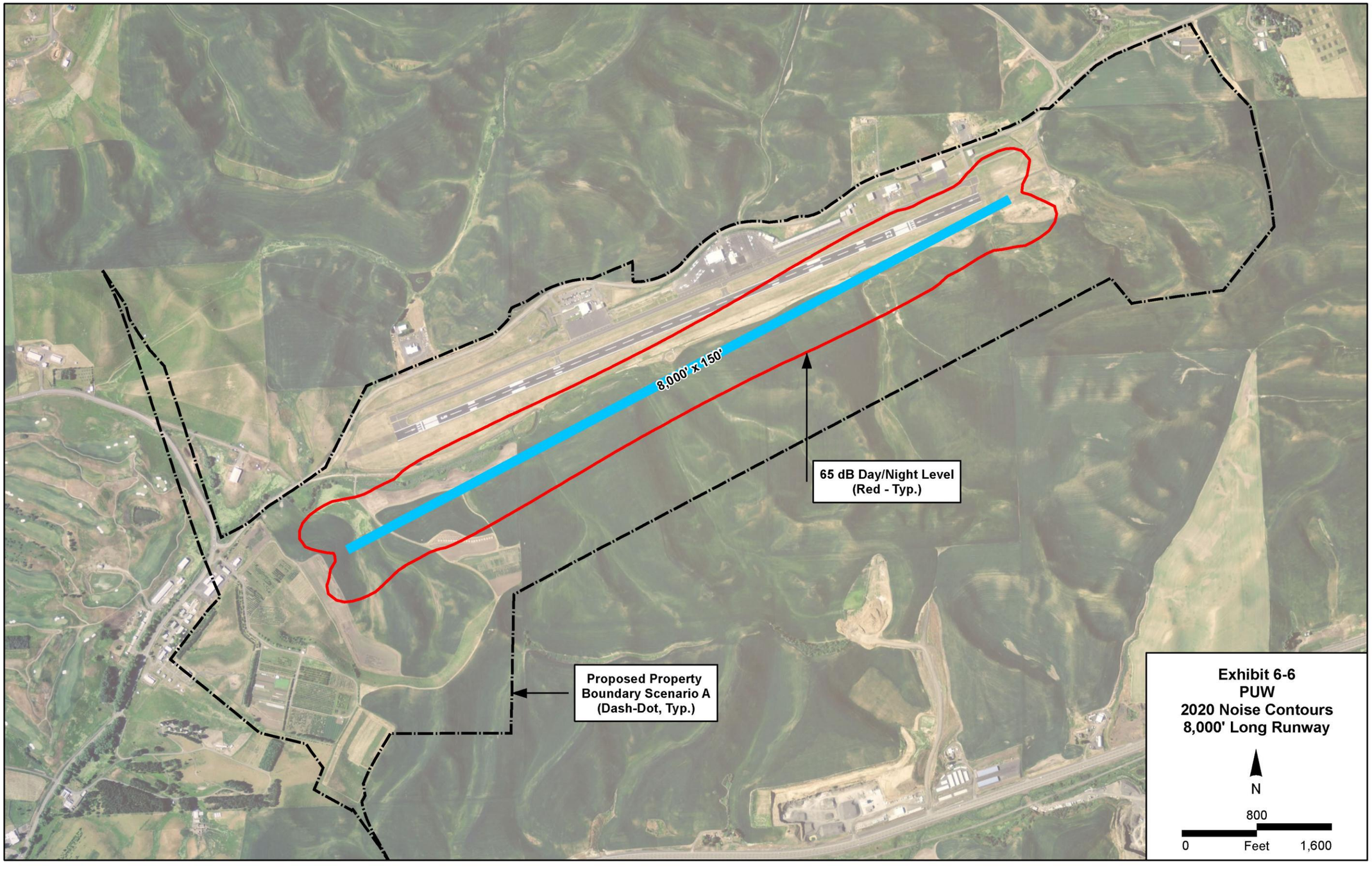
Flight track information represents the path over the ground followed by an aircraft. At airports without an airport traffic control tower, the FAA suggests consolidating approach, departure, and touch-and-go flight tracks into average flight tracks. Average flight tracks are included in **Appendix I.** Flight tracks were developed with airport management.

Analysis

The following exhibits show aircraft noise exposure contours at PUW in relation to the Airport and surrounding areas. **Exhibit 6-4** shows contours for 2010, **Exhibit 6-5** shows forecasted noise contours for 2015 and **Exhibit 6-6** shows forecasted noise contours for 2020.


Existing Property Boundary
(Dash-Dot, Typ.)
6,730' x 100'
65 dB Day/Night Level
(Red - Typ.)
Exhibit 6-4
PUW
2010 Noise Contours
6,730' Long Runway
N
800
0
Feet
1,600


7,100' x 150'
65 dB Day/Night Level
(Red - Typ.)
Proposed Property
Boundary Scenario A
(Dash-Dot, Typ.)
Exhibit 6-5
PUW
2015 Noise Contours
7,100' Long Runway
N
800
0
Feet
1,600


8,000' x 150'
65 dB Day/Night Level
(Red - Typ.)
Proposed Property
Boundary Scenario A
(Dash-Dot, Typ.)
Exhibit 6-6
PUW
2020 Noise Contours
8,000' Long Runway
N
800
0
Feet
1,600

Noise Summary

There are very few developed parcels of land currently located near the airport. Noise sensitive land uses near the Airport include some single-family residential development to the east and agricultural research buildings associated with WSU to the west. The 65 DNL contour is contained within the airport property boundary for existing and forecasted operations. Consideration has been given to proposed airport improvements. There are no noise compatibility issues for regulatory or remedial consideration at PUW.

Although the 65 DNL contour is the FAA's threshold for significant noise impacts, WSDOT Guidebook Appendix B indicates that there are shortcomings with the DNL evaluation system. "Noise contours fail to fully explore the relationship and interaction between aircraft and the community." Noise contours represent the average day-night sound level for a year of operations. Individual over-flights by particular aircraft or peak operations are not reflected in noise contours.

Aircraft over-flight is another method of evaluating land use compatibility. Aircraft operations from the two runway ends at PUW have been evaluated for potential over-flight impacts. High impacts pass directly above noise sensitive land uses, medium impacts pass near but not directly above noise sensitive land uses near the Airport, and low impacts do not pass above or near noise sensitive land use. Potential over-flight noise impacts are presented in **Table 6-2**.

Table 6-2: Potential Over-flight Noise Impacts

Runway	2010 Operations	Approach	Departure
05	60%	Medium	Low
23	40%	Low	Medium

Land use surrounding the Airport is evaluated by jurisdiction in **Section 3.0**.

In addition to noise, the WSDOT Guidebook includes Airport Safety Compatibility Zones (ASCZ) that can be used to help municipalities plan land use surrounding airports. ASCZs consider aircraft noise and common locations of aircraft accidents around airports. ASCZs for PUW are included in **Section 3.0.**

6.5 Land Use Action Plan (Implementation Toolbox)

Airports and the surrounding communities have a symbiotic relationship. Impacts from the airport are felt directly and indirectly in the community and vice versa. Some of the airport impacts on the community are negative including noise, vibration, odor and accident risks. Others are positive including economic impacts and quality of life elements. This relationship is easy to understand for everyone who has heard an airplane fly overhead or who has flown to a vacation destination.

The other side of the equation, the impact that communities have on airports, may not be as obvious to residents and local officials. Development around an airport can have a direct, negative impact on airport safety, efficiency and economic viability. These impacts come from tall buildings and structures and even tall trees that can be hazardous to aircraft. They can also be a result of incompatible urban development near an airport that may directly interfere with aviation operations and compromise safety areas. However, an effective airport land use compatibility effort from the local community supports development around the airport while providing for public safety. This, in turn, supports the local economy, the community's quality of life and the public investment in the airport. Airport land use compatibility is a win-win situation for the airport and the surrounding communities.

Incompatible Land Uses

Height

The idea that tall buildings and objects are incompatible with airport activity is fairly intuitive. Even without extensive technical knowledge, it makes sense that objects extending into the air near the runway can get in the way of an airplane on approach or departure, which can cause accidents. In addition to the hazard presented by tall structures, they can also restrict an airport's operational efficiency. For example, an airport may have to stop using the end of an existing runway to avoid the object, which shortens the runway's operational length. As communities consider airport land use compatibility issues, a better understanding of the conflict is helpful to creating an effective local policy.

When considering height conflicts, community planners need to think about both location and types of conflicts. Height restrictions correspond specifically to airspace protection areas defined by the Part 77 Surfaces around an airport. This means that tall structures can impact areas miles beyond the end of the runway. Communities should also think about the variety of solid objects that can cause conflict with aviation activity. The list of potential height hazards includes building and other built structures, trees, high terrain, power lines, construction cranes and sometimes even mobile objects such as vehicles on a road.

Height regulation is a critical example of the need for airport land use compatibility cooperation between airports and local governments. Although there is an FAA review process through FAA Form 7460-1, the review process results in a "Determination of Hazard" that has no impact on the permitting process. Neither the FAA nor the local airport administration has regulatory authority to prohibit the development of tall structures in critical airspace. Only the local land use agency has land use permitting authority. The process also depends on local zoning officials who are in a "boots on the ground" position to identify the need for an airspace review as part of the review and permitting process.

There are several challenges to effective implementation. One is the complexity of communicating the location of the three-dimensional Part 77 Imaginary Surfaces on a two-dimensional zoning map or in zoning ordinance text. At the most basic level, a perimeter ring on the zoning map can be used to indicate the area in which structure height may be an issue. Development within the area can be flagged for a height review by the FAA, WSDOT staff or the airport manager through an airport overlay zone provision.

Another challenge is the need for ongoing communication between local units of government and the community airport about long-range planning goals. The local community should communicate at least annually with the airport to understand plans for runway extensions or new types of instrument approach procedures. This will help protect the long-term airspace needs of the airport through local land use zoning regulation, which takes time to amend.

Airport Safety and Accident Data

Some airport land use compatibility issues are related to public safety. These initiatives are based on an analysis of accident data and the associated implications for the safety of aircraft operations in the air and for people and structures on the ground. As noted in **Section 3.4**, the WSDOT *Airport and Compatible Land-Use Program Guidebook* (January 2011) references the 2002 *California Airport Land Use Planning Handbook* and its comprehensive examination of accident locations around general aviation airports nationwide. The WSDOT *Airport and Compatible Land-Use Program Guidebook* incorporates the Airport Compatibility Safety Zones (ACSZ) from the *California Airport Land Use Planning Handbook* analysis. Unlike the original data that appear as a scatter graph, the safety zones are identified as areas with regular geometric patterns to facilitate implementation. The hierarchy of safety zones is based on the varying degree of risk in each area and is associated with a distinct set of compatible land uses. The ACSZs are included in Appendix F of the WSDOT *Airport and Compatible Land-Use Program Guidebook*. The ACSZs and their associated compatible land use provisions can be imported by local land use authorities into an airport overlay zoning district.

Statistically, accidents are most likely to occur in Zone 1 at the runway ends and least likely in Zone 6, which includes all of the area used regularly for aviation approach and departure activity. Each zone has an associated set of compatible and incompatible land uses. **Table 6-3** summarizes them generally by location in relationship to the runway.

Table 6-3: Airport Land Use Compatibility Matrix

	Near runway ends	*Within runway approaches*	*Beneath traffic patterns*
Agricultural	Compatible if not wildlife attractant	Compatible if not bird attractant	Compatible if not wildlife attractant
Utilities/ transportation	Incompatible (Avoid)	Compatible	Compatible
Parks / recreation	Incompatible	Compatible if low density	Compatible
Industrial	Compatible at low intensity	Compatible if it does not produce airspace obstructions or have bulk amounts of hazardous materials	Compatible if it does not produce airspace obstructions
Retail / service	Incompatible	Compatible at low intensity	Compatible
Offices	Incompatible	Compatible at low intensity	Compatible
Light Industrial	Compatible at low intensity	Incompatible	Compatible
Places of worship	Incompatible	Incompatible	Incompatible
Residential	Incompatible	Incompatible	Incompatible
Children's schools	Incompatible	Incompatible	Incompatible
Hospitals	Incompatible	Incompatible	Incompatible

Local land use regulation should incorporate the specific ACSZ recommendations into an overlay zone or zoning district designations within the airport's area of influence.

Noise

The earliest driver of airport land use compatibility was noise conflicts. There is no question that noise from aircraft operations can be disruptive to residential, educational and other land uses. Noise conflicts reduce the quality of life for residents and may create an adversarial relationship between the airport and portions of the community.

Noise related issues are challenging in part because the perception of an acceptable level of noise varies from person to person, varies depending on location and activity and varies depending on time of day. A noise that might go unnoticed in the middle of the day at a commercial shopping area might be unacceptable in the middle of the night in a residential neighborhood.

Sound is measured in units of decibels (dbA). An increase of 10 dbA represents sounds that are perceived to be twice as loud. Sound levels of 65 dbA are annoying to most individuals. Constant or repeated exposure to levels of 90 dbA or higher can lead to hearing loss. The table (**Table 6-4**) below provides examples of various sound levels:

Table 6-4: Sound Levels Generated by Various Sources of Noise

Sound Level	dbA
Quiet library, soft whispers	30
Living room, refrigerator	40
Light traffic, normal conversation, quiet office	50
Air conditioner at 20 feet, sewing machine	60
Exposure to the following sound levels can be annoying	
Vacuum cleaner, hair dryer, noisy restaurant	70
Average city traffic, garbage disposals, alarm clock at 2 feet	80
Constant exposure to the following sound levels can lead to hearing loss	
Subway, motorcycle, truck traffic, lawn mower	90
Garbage truck, chain saw, pneumatic drill	100
Rock band concert in front of speakers, thunderclap	120
Gunshot blast, jet plane	140
Rocket launching pad	180

Source: Deafness Research Foundation

This measurement scale is incorporated into the system of definitions, analysis and mitigation tools set forth in federal noise guidelines and regulations. Federal regulations provide direction to address regulatory challenges. For noise conflicts associated with existing development, FAR Part 150, *Airport*

Noise Compatibility Planning, establishes a voluntary program that can be used by airports to conduct airport noise compatibility planning and implementation.

As part of this planning process, federal noise standards for airports were used to perform a noise analysis for the current and proposed runway alignment at PUW. There were no areas of concern based on the 65 dbA contours since these areas are contained on the airport property through the planning period of 2020.

Hazardous Uses

In some instances, land uses that are generally compatible with airport activity may include operational or design elements that make them incompatible with aviation activity. Most are related to features that obscure a pilot's view or imitate navigational elements of the airport. The following are all incompatible elements:

- Smoke, steam and smog
- Glare and dust
- Light emissions
- Thermal plumes
- Flammable liquids

These are incompatible elements that can be part of an agricultural, commercial or industrial land use. Because these elements are related to specific site design or operations rather than overall land use categories, they need to be addressed as part of the plan review process rather than through the zoning district regulation. Planning staff should be aware of these conflicts and consider airport land use compatibility issues during the development review process. A Conditional Use Permit may be an effective way to address airport land use compatibility within the ASCZ.

Wildlife Hazards

Wildlife hazards are another category of aviation hazard. Wildlife hazards include collisions between aircraft and birds in the air and aircraft and animals on the runway. Termed "wildlife strikes," this hazard causes both human deaths and destruction of aircraft at an alarming rate nationwide. Airport land use compatibility regulations for adjacent communities should be aimed at preventing site design features that attract wildlife near the airport, including open water features, wetlands, sewage ponds and fountains. Airports may develop a wildlife management plan that can be further coordinated with local zoning requirements. FAA AC 150 / 5200-33, *Hazardous Wildlife Attractants on or near Airports* (1997) and an FAA manual titled *Wildlife Hazard Management at Airports* are technical resources on the topic.

Airport Land Use Compatibility Resources

Communities and planning staff in Washington have a wealth of resources for airport land use compatibility from WSDOT Aviation. The office has a webpage portal to a range of resource documents and contact information at http://www.wsdot.wa.gov/aviation. There is a "planning" category that includes links to all of the following:

- The State's 20-Year Aviation System Plan
- The Washington State Long-Term Air Transportation Study (LATS)
- Washington State Aviation Policy
- *Land Use Compatibility*
- Height Hazards
- Participating in the Planning Process—A Guide for Airport Advocates

For airport land use compatibility, the WSDOT *Airport Land-Use Compatibility Guidebook* (2011) is a primary resource for communities in Washington. The guidebook is an update to a 1999 state guidebook on the same topic. Also, WSDOT Aviation staff provides an Airport Land Use Compatibility Technical Assistance Program to assist communities with local efforts to promote airport land use compatibility.
There are many other examples of other airport land use compatibility resources listed on the WSDOT Aviation website too. They include national resources from the FAA and the American Planning Association, other state guidebooks, and regional and local examples of implementation efforts. For example, the Airport Cooperative Research Program (ACRP) of the Transportation Research Board (TRB) produced a national resource titled *Enhancing Airport Land Use Compatibility - Report 27;* California, Oregon, Florida, Iowa and other states have developed airport land use compatibility guidebooks; and the Puget Sound Regional Council has been a leader in Washington, promoting airport land use compatibility.

Implementation Steps

Chapter 2 of the WDSOT Guidebook provides a Step by Step Compatibility Process that is an implementation guide for communities. This PUW Phase II Airport Master Plan addresses many if not all of the items in the first three steps:

- Step 1: Getting Started and Gathering Data
- Step 2: Delineate the Airport Area of Influence
- Step 3: Identify Compatibility Concerns

The next steps in the Compatibility Process are done through the community's Comprehensive Plan and zoning ordinance. The process can be undertaken by a single entity or may be pursued collectively through a joint planning effort. A joint planning effort offers the opportunity for a consistent, universal approach to airport land use compatibility even if the resulting products are adopted independently.

Model Policy Language and Regulations

Communities can find a good starting place for policy and regulatory language in the WSDOT Guidebook and on the WSDOT Aviation website. While each community will want to modify and customize these resources to fit their own unique attributes and goals, there is no need to "reinvent the wheel." Communities can also find support resources through WSDOT's Airport Land Use Compatibility Technical Assistance Program. Professional planning consultants are another resource for local planning initiatives.

Appendix J in the WSDOT Guidebook is titled "Comprehensive Plan Goals and Policies." This material is offered for use by communities in creating or updating planning documents.

The ACRP Report, *Enhancing Airport Land Use Compatibility - Report 27* includes a comprehensive model zoning ordinance. It gives basic guidance but also offers best practices for jurisdictions that want to go somewhat further in ensuring compatibility. It provides a range of options for consideration and can be adopted either as a stand-alone ordinance or integrated into a local zoning district or overlay district. This document is included in **Appendix H** and is also available electronically from the TRB website.

6.6 Conclusion

When an airport and its surrounding communities work together to promote airport land use compatibility, the result is a win-win situation. Compatibility measures improve safety and efficiency at the airport while preserving opportunities for future expansion. In the community, land use compatibility improves public safety, protects the public investment in the airport infrastructure and improves the community's quality of life.

Guidance and leadership on compatibility starts at the federal level. Grant assurances and the Form 7640-1 review process are both in place to advance the cause. The State of Washington provides broad support to airport land use compatibility through state law, the WAC and dedicated resources through WSDOT Aviation. But the power of implementation rests solely with the local unit of government. Only the City of Pullman and Whitman County have the regulatory authority to implement zoning regulations and approve development applications.

Airport land use compatibility includes several different considerations. Specific land uses near the runway are important considerations that can be guided by the ACSZ included in the State of Washington's *Airports and Compatible Land Use Guidebook*. In addition, the development design of individual parcels in the area can address off-site impacts including steam, smoke and glare that can be hazards to aviation. Both uses and design regulations can improve safety for both aircraft in the air and people on the ground. Noise is a longstanding compatibility issue between airports and nearby uses. At PUW, there are no off-site noise impacts from the current or future runway configurations as defined by current regulatory practices although the 55 DBL contour lines reach adjacent parcels and may cause disruption for noise sensitive uses. Tall structures and wildlife hazards are other important considerations with specific federal guidelines.

This master plan provides baseline data defining the areas of influence and analyzes for noise and land use compatibility—the first three recommended steps from the *Airports and Compatible Land Use Guidebook*. All of these combine to create a solid starting point for protecting and improving airport land use compatibility around PUW. There is a wealth of resources available to guide implementation efforts, including a model ordinance from ACRP Report 27, the revised state guidebook, the land use compatibility resources on the WSDOT aviation website and the Airport Land Use Compatibility Technical Assistance Program. Both the City of Pullman and Whitman County have recognized the need for airport land use compatibility through current provisions in the zoning ordinance. However, those provisions can be strengthened to provide clearer, more comprehensive regulatory authority in the future.